

# Chromosome Numbers in *Ashmunella*

(Gastropoda : Pulmonata : Polygyridae)

BY

EDWARD M. STERN

Department of Zoology and Physiology, Louisiana State University, Baton Rouge 70803

AND

ARTIE L. METCALF

Department of Biological Sciences, University of Texas at El Paso 79968

(2 Plates, 1 Map)

## INTRODUCTION

MEMBERS OF THE land snail genus *Ashmunella* (Polygyridae) are confined mainly to mesic forested mountains in the southwestern United States and adjacent Mexico, although some species inhabit relatively arid slopes and canyons. Because of the multiplicity of local races the taxonomic status of most species is problematic. The diversity of conchological characters is broad, ranging from toothless, smooth shells to dentate, highly sculptured species. Anatomical distinctions are subtle and PILSBRY (1940:913) believed the genus to be relatively homogeneous in regard to anatomy (see also STERN, 1973).

Chromosome numbers are known for less than 0.5% of the species of Recent mollusks according to PATTERSON (1971:169) with most of the work appearing in the past few years. Herein, 14 geographically isolated species or subspecies of *Ashmunella* have been analyzed. The Map indicates the distribution of the species examined and the localities are identified in the section "Localities."

## METHODS AND MATERIALS

Snails were injected directly through the shell near the apical whorl with 0.075 cc of Velban (1 mg/ml concentration) and returned to their containers for a period of 14-16 hours. The animals were then killed and the ovotestis removed. Chromosome preparations were made using an

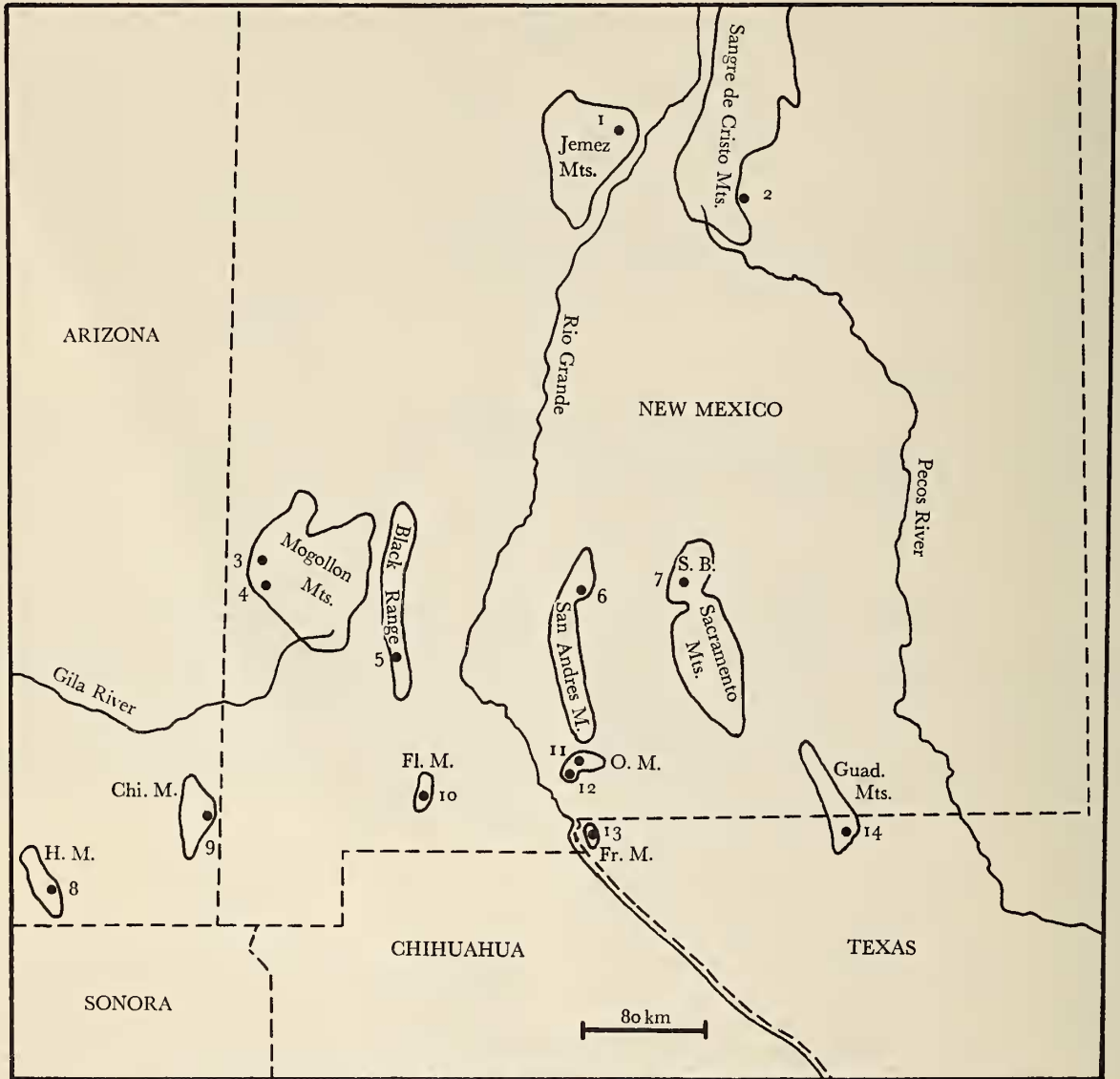
acetic-orcein squash technique. The process has been outlined by MCPHAIL & JONES (1966:767-768). Chromosomes were observed with a Wild compound microscope with 10× oculars and 100× phase contrast oil immersion objectives.

Photographs were made using a Nikon M-35S camera mounted on a Wild microscope and Kodak 35 mm high contrast copy film.

## RESULTS

Euthyneuran snails are hermaphroditic and have no sex chromosomes but because they are hermaphroditic both spermatogenesis and oögenesis can be observed in the ovotestis. For this reason, meiotic spreads are easily prepared. A few mitotic cells were occasionally observed in this study but because of their rarity and the chances of locating a cell in which centromeres were readily visible and chromosomes well spread, no karyotypes were determined. Although karyotypes are species-specific and useful in species discrimination, few detailed comparative studies have been conducted (PATTERSON, 1969). In this study only chromosome numbers were determined.

The diploid number for each of the 14 species was determined to be  $2n=58$ . The meiotic chromosomes ( $n=29$ ) for each of the species are illustrated in Figures 1-14. Numbers of individuals and of spreads examined are indicated in the section "Localities."



Map of a part of southwestern United States and adjacent México indicating localities from which 14 kinds of *Ashmunella* were obtained. Locality numbers are as in the section "Localities" in text.

- |                                |                                 |
|--------------------------------|---------------------------------|
| Chi. M. - Chiricahua Mountains | Fl. M. - Florida Mountains      |
| Fr. M. - Franklin Mountains    | Guad. - Guadalupe               |
| H. M. - Huachuca Mountains     | O. M. - Organ Mountains         |
|                                | S. B. - Sierra Blanca Mountains |

Explanation of Figures 1 to 8

Meiotic chromosomes for 8 species of *Ashmunella*  
 (Arrows [Figures 5, 7, and 8] indicate where 2 chromosomes overlap)

- |  |  |
|--|--|
| Figure 1: <i>Ashmunella ashmuni</i> (Dall, 1896)                     | Figure 5: <i>Ashmunella mendax</i> Pilsbry & Ferriss, 1917     |
| Figure 2: <i>Ashmunella thomsoniana</i> (Ancey, 1887)                | Figure 6: <i>Ashmunella</i> sp. ( <i>rhyssa</i> complex)       |
| Figure 3: <i>Ashmunella mogollonensis</i> Pilsbry, 1900              | Figure 7: <i>Ashmunella rhyssa altissima</i> (Cockerell, 1898) |
| Figure 4: <i>Ashmunella tetradon inermis</i> Pilsbry & Ferriss, 1915 | Figure 8: <i>Ashmunella levettei</i> (Bland, 1882)             |
- scale lines equal 5 μm

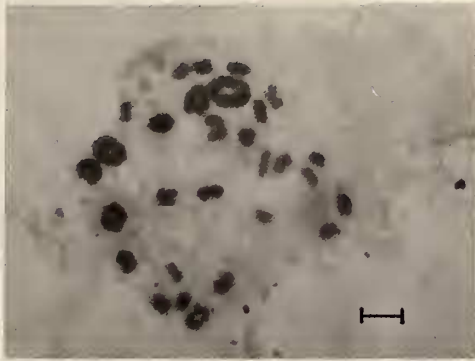


Figure 1



Figure 2

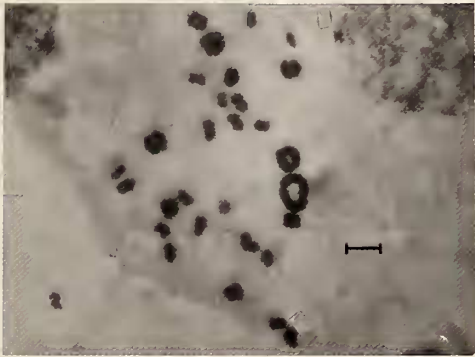


Figure 3

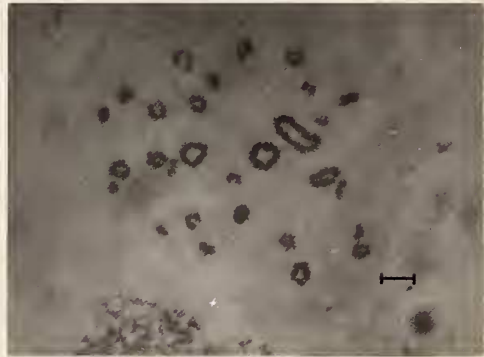


Figure 4



Figure 5

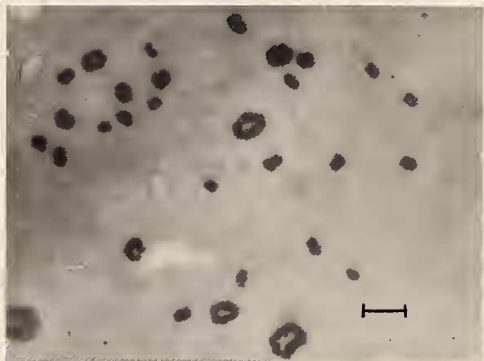


Figure 6



Figure 7



Figure 8

